

Claim Status

The present Amendment is in response to the Official Action dated November 2, 2006. As suggested in said Official Action, Applicant hereby cancels claims 1-48 without prejudice and presents claims 49-69. Applicant submits that all of the newly added claims read on the elected invention. Accordingly, Applicant submits that all objections to the claim numbering has been overcome and may now be withdrawn.

Specifically, independent claim 49 recites a nozzle tip comprising:

a tip retainer comprising a first and a second end region and a central bore extending between said first and said second end regions, said central bore comprising an internally threaded portion disposed proximate said first end region configured to removeably engage with a nozzle housing and an internal annular step extending generally radially inwardly proximate said second end region, wherein a distal most end face of said second end region is substantially radially planar;

a tip insert axially received in said central bore of said tip retainer, said tip insert further comprising a tip channel, at least one outlet aperture in fluid communication with said tip channel, and an external annular step extending generally radially outwardly from an exterior surface of said tip insert that substantially abuts against said internal annular step of said tip retainer, wherein said internal annular step and said external annular step comprise a stop shoulder that limits axial movement of said tip insert from said first end region towards said second end region of said tip retainer;

a seal ring comprising a third end region having a distal most substantially radially planar end face and a fourth end region configured to seal against at least a portion of a mold, wherein

said seal ring comprises a material having a lower thermal conductivity than said tip retainer; and
a substantially radially planar weld junction disposed between said distal most substantially radially planar end faces of said tip retainer and said seal ring.

Applicant submits that this claim reads on the elected invention. Support for this claim can be found, for example, in FIGS. 1, 3, and 4 as well as paragraphs [0035], [0036], [0039], [0040] and [0043].

Dependent claim 50 recites, *inter alia*, that the tip insert further comprises a shank portion and an end portion and that the external annular step extends generally radially outwardly from an exterior surface of the shank portion. Support for this amendment may be found, for example, in paragraph [0053] as well as FIGS. 1 and 14-16.

Dependent claim 51 recites, *inter alia*, that shank portion comprises a material having a high thermal conductivity and said end portion comprises a material having a high wear-resistance. Dependent claim 52 recites, *inter alia*, that shank portion comprises a copper alloy and the end portion comprises a carbide alloy. Support for these amendments may be found, for example, in paragraph [0053].

Dependent claim 53 recites, *inter alia*, that the fourth end region of the seal ring further comprises a generally frustoconical exterior surface having a minimum diameter proximate the third end region and a maximum diameter proximate a distal most end of the fourth end region. Support for this amendment may be found, for example, in FIG. 1.

Dependent claim 54 recites, *inter alia*, that an exterior surface of the second and the third end regions proximate the substantially radially planar weld junction comprise outer perimeters that substantially correspond to each other. Support for these amendments may be found, for example, in paragraph [0043] as well as FIG. 1.

Dependent claim 55 recites, *inter alia*, that the exterior surface of the tip retainer further comprises a circumferential groove disposed proximate the second end region and a heater disposed about at least a portion of the exterior surface of the tip retainer and within the circumferential groove. Support for this amendment may be found, for example, in paragraph [0043] as well as FIGS. 3 and 4.

Dependent claim 56 recites, *inter alia*, that the seal ring further comprises a cavity axially aligned with the central bore and extends from the third end region to the fourth end region. The third end region comprises an inner diameter substantially corresponding to an inner diameter of the first central bore proximate the second end region. Support for this amendment may be found, for example, in paragraph [0043] as well as FIGS. 1 and 5.

Dependent claim 57 recites, *inter alia*, that the substantially radially planar weld junction extends from the exterior surfaces of the seal ring and the tip retainer to an inner surface of the cavity and the central bore. Support for this amendment may be found, for example, in paragraph [0040] and FIGS. 1 and 4.

Independent claim 58 recites a nozzle tip comprising:

- a tip retainer comprising:
 - a first end region;

a second end region comprising a substantially radially planar distal most end face; and

a central bore extending between said first and said second end regions; and a seal ring comprising a third end region having a substantially radially planar distal most end face welded to said substantially radially planar distal most end face of said tip retainer and a fourth end region configured to seal against at least a portion of a mold, wherein said seal ring comprises a material having a lower thermal conductivity than said tip retainer.

Applicant submits that this claim reads on the elected invention. Support for this claim can be found, for example, in FIGS. 1, 3, and 4 as well as paragraphs [0035], [0036], [0039], [0040] and [0043].

Dependent claim 59 recites, *inter alia*, that the third end region comprises an exterior surface having an outer perimeter substantially corresponding to an outer perimeter of an exterior surface of the second end region proximate the weld. Support for this claim can be found, for example, in paragraph [0043] as well as FIGS. 1 and 5.

Dependent claim 60 recites, *inter alia*, that the seal ring further comprises a cavity axially aligned with the central bore and extending from the third end region to the fourth end region of the seal ring, wherein the third end region comprises an inner diameter substantially corresponding to an inner diameter of the second end region of the first central bore proximate the weld. Support for this claim can be found, for example, in paragraph [0043] as well as FIGS. 1 and 5.

Dependent claim 61 recites, *inter alia*, that the weld extends substantially radially inwardly along the substantially radially planar distal most end faces of the

tip retainer and the seal ring from the exterior surfaces of the seal ring and the tip retainer to an inner surface of the cavity and the central bore. Support for this amendment may be found, for example, in paragraph [0040] and FIGS. 1 and 4.

Dependent claim 62 recites, *inter alia*, that the fourth end region of the seal ring further comprises a generally frustoconical outer surface having a minimum diameter proximate the third end region and a maximum diameter proximate a distal most end of the fourth end region. Support for this amendment may be found, for example, in FIG. 1.

Dependent claim 63 recites, *inter alia*, that the exterior surface of the tip retainer further comprises a circumferential groove disposed a spaced distance from the substantially radially planar distal most end face of the second end region, wherein a portion of a heater is disposed within the circumferential groove and about the exterior surface of the first end region of the tip retainer. Support for this amendment may be found, for example, in paragraph [0043] as well as FIGS. 3 and 4.

Dependent claim 64 recites, *inter alia*, a tip insert axially received in the central bore of the tip retainer. The tip insert further comprises a shank end, a tip end having an outlet aperture, and an external annular step extending generally radially outwardly from an exterior surface of the shank end that substantially abuts against an internal annular step extending generally radially inwardly from the second end region of the central bore. The internal and the external annular steps comprise a stop shoulder that limits axial movement of the tip insert from the first end region towards the second end region of the

tip retainer. Support for this claim may be found, for example, in paragraphs [0036] and [0053] as well as FIGS. 1 and 14-16.

Independent claim 65 recites a nozzle tip
comprising:

a tip retainer comprising a first central bore extending between a first and a second end region wherein said second end region comprises a substantially radially planar distal most end face; and

a seal ring comprising a material having a lower thermal conductivity than said tip retainer, said seal ring further comprising:

a third end region having a substantially radially planar distal most end face welded to said substantially radially planar distal most end face of said tip retainer;

a fourth end region having a generally frustoconical exterior surface having a minimum diameter proximate said third end region and a maximum diameter proximate a distal most end of said fourth end region; and

a second central bore extending between said third and said fourth end regions, said second central bore having an inner diameter proximate said third end region substantially corresponding to an inner diameter of said second end region of said first central bore.

Applicant submits that this claim reads on the elected invention. Support for this claim can be found, for example, in FIGS. 1, 3, and 4 as well as paragraphs [0035], [0036], [0039], [0040] and [0043].

Dependent claim 66 recites, *inter alia*, that the tip retainer comprises a steel material and the seal ring comprises a copper alloy material. Support for this claim may be found, for example, in paragraph [0041].

Dependent claim 67 recites, *inter alia*, that the third end region of the seal ring comprises an exterior surface

having a perimeter substantially corresponding to a perimeter of an exterior surface of the second end region of the tip retainer proximate the weld. Support for this claim can be found, for example, in paragraph [0043] as well as FIGS. 1 and 5.

Dependent claim 68 recites, *inter alia*, that the weld extends substantially radially inwardly from the exterior surfaces of the seal ring and the tip retainer to an inner surface of the first and the second central bores along the substantially radially planar distal most end faces. Support for this amendment may be found, for example, in paragraph [0040] and FIGS. 1 and 4.

Dependent claim 69 recites, *inter alia*, that a tip insert axially received in said first central bore of said tip retainer. The tip insert further comprises a shank end, a tip end, and an external annular step extending generally radially outwardly from an exterior surface of the shank end that substantially abuts against an internal annular step extending generally radially inwardly from the second end region of the first central bore. The internal and the external annular steps comprise a stop shoulder that limits axial movement of the tip insert from the first end region towards the second end region of the tip retainer. Support for this claim may be found, for example, in paragraphs [0036] and [0053] as well as FIGS. 1 and 14-16.

Accordingly, claims 49-69 are under consideration. Applicant submits that all claims read on the elected invention and that no new matter has been added. Entry of the above amendments is respectfully requested pursuant to the Request for Continued Examination filed May 31, 2006.

REMARKS

This is in response to the Office communication dated November 2, 2006. The present amendments are being presented under 37 C.F.R. § 1.114 as being submitted subsequent to the Request for Continued Examination filed May 31, 2006. Accordingly, Applicant respectfully requests reconsideration and allowance of the present application in view of the above amendments and following remarks.

Non-Responsive Amendment

In the Office communication dated November 2, 2006, the previous amendment was deemed not fully responsive due to an error in the claim numbering. As suggested in said Office communication, the present amendment cancels claims 1-48 without prejudice and presents new claims 49-69 which are directed to the elected invention. Accordingly, Applicant submits that the present amendments are fully responsive and that the objections of said Office communication have been corrected and may now be withdrawn.

Rejections under 35 U.S.C. § 102(b) and 103(a)

In the Final Office Action dated April 7, 2006 (hereinafter referred to as the "Final Office Action"), claims 1, 2, 4, 20, and 24-28 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,573,185 to Schwarzkopf (hereinafter referred to as "Schwarzkopf") or, in the alternative, under 35 U.S.C. § 103(a) in view of Schwarzkopf. In the Final Office Action, the Examiner states that the body 1 of Schwarzkopf reads on the nozzle tip retainer, the ring 9 of Schwarzkopf reads on the seal ring of, and that removable nozzle element 4 reads on the

tip insert. Although these claims have now been cancelled without prejudice, Applicant respectfully traverses these rejections. Applicant also respectfully submits that Schwarzkopf does not disclose or suggest all of the limitations recited in independent claims 49, 58, and 65.

For example, independent claims 49, 58, and 65 generally recite, *inter alia*, that the substantially radially planar distal most end faces of the tip retainer and the seal ring are welded. At the outset, Applicant submits that the terms "welded" and "weld junction" as used in independent claims 49, 58, and 65 are structural limitations. Specifically, Applicant directs the Examiner's attention to MPEP § 2113 which cites to the holding in *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979) (holding "interbonded by interfusion" to limit structure of the claimed composite and noting that terms such as "welded," "intermixed," "ground in place," "press fitted," and "etched" are capable of construction as structural limitations.)

In contrast to independent claims 49, 58, and 65, Schwarzkopf discloses that "[t]he ring 9 is secured in place by an outer weld 12 between the lip 14 [of the ring 9] and the front end of the sleeve 7 and an inner weld 13 filling the triangular-section gap between the inner surface of the ring 9 and the [side] surface 8 [of the tubular body 1]." (*Schwarzkopf*, column 2, lines 52-55, emphasis added.) More specifically, Schwarzkopf clearly discloses in FIG. 3 that the ring 9 is only secured to the body 1 by inner weld 13 which is substantially along the longitudinal axis A of the body 1 between the side surface 8 of the body 1 and the inner surface of the ring 9.

As the Examiner may appreciate, the side surface 8 of the body 1 of Schwarzkopf that is secured to the ring 9 by inner weld 13 is neither radially planar nor the distal most end face of the body 1. (See, for example, Schwarzkopf at lines 35-38, "[T]he front end of the body 1 is formed with a step 8, 10 in turn constituted by a frustoconical and forwardly flaring side surface 8 and a planar and axially forwardly directed annular end face.") Moreover, the inner surface of the ring 9 which is secured to the body 1 by inner weld 13 is neither radially planar nor the distal most end face of the ring 9. (See, for example, Schwarzkopf at lines 42-45, "[A] planar rear face of the ring 9 flatly abuts the end face 10 while a cylindrical inner surface of the ring [9] forms a triangular-section space with the side surface 8 [of the body 1].") Accordingly, Applicant respectfully submits that Schwarzkopf does not disclose or suggest that the substantially radially planar distal most end faces of the tip retainer and the seal ring are welded as generally recited in independent claims 49, 58, and 65.

Additionally, independent claim 49, 58, and 65 generally recite, *inter alia*, that the seal ring comprises a material having a lower thermal conductivity than the tip retainer. In the Final Office Action, the Examiner states that the body 1 and ring 9 of Schwarzkopf are different materials "as shown by the different cross-hatching in figure 3." Applicant respectfully traverses this conclusion.

37 C.F.R. § 1.84(h) (3) states, in relevant part, Hatching must be used to indicate section portions of an object, and must be made by regularly spaced oblique parallel lines spaced sufficiently apart to enable the lines to be distinguished without

difficulty. ... Hatching must be at a substantial angle to the surrounding axes or principal lines, preferably 45°. ... The parts in cross section must show proper material(s) by hatching with regularly spaced parallel oblique strokes, the space between strokes being chosen on the basis of the total area to be hatched. ... The hatching of juxtaposed different elements must be angled in a different way. Different types of hatching should have different conventional meanings as regards the nature of a material seen in cross section.

Applicant submits that the body 1 and ring 9 in FIG. 3 of Schwarzkopf are "juxtaposed different elements" in which the same hatching is simply "angled in a different way." While the hatching lines may be spaced differently between body 1 and ring 9 in FIG. 3, the total area of body 1 and ring 9 is different and "the space between strokes [should be] chosen on the basis of the total area to be hatched." Accordingly, Applicant submits that the cross-hatching of body 1 and ring 9 does not disclose or suggest to one of ordinary skill in the art that the body 1 and ring 9 are different materials.

Moreover, Applicant submits that the written disclosure of Schwarzkopf does not disclose or suggest forming the ring 9 from a material having a lower thermal conductivity than the body 1 as recited in independent claims 49, 58, and 65. Schwarzkopf discloses that the body 1 may include steel (Schwarzkopf at column 2, line 25) and is generally silent regarding what material the ring 9 may be constructed. However, Schwarzkopf discloses that the object of the invention is to prevent damage to the front end of the nozzle when the ring is pushed "back into the space between the sleeve and the body." (*Id.* at column 1, lines 26-27.) As such, one skilled in the art would likely be motivated to manufacture the body 1 and the ring 9 out

of the same material having sufficient strength, namely, steel, absent a specific teaching or suggestion to the contrary. Nevertheless, Applicant submits that Schwarzkopf cannot be fairly said to teach constructing the ring 9 from a material having a lower thermal conductivity than the body 1. Should the Examiner disagree with either of these positions, explicit support in the description of Schwarzkopf is respectfully requested.

Regarding the Examiner's alternative position (i.e., that different materials other than steel are well known), Applicant respectfully traverses this conclusion. While Applicant agrees that materials other than steel are well known, Applicant submits that the mere fact that materials other than steel are well known is not sufficient to support the Examiner's position.

Accordingly, Applicant respectfully submits that Schwarzkopf does not disclose or suggest all of the limitations recited in independent claims 49, 58, and 65.

Conclusion

For at least the reasons discussed above, Applicant submits that all pending claims are in condition for allowance. Early and favorable action is respectfully requested. The Commissioner is hereby authorized to charge payment of any additional filing fees under \$1.16 associated with this communication or credit any overpayment to Deposit Account No. 50-1388.

The Examiner is invited to telephone Applicant's Attorney, Richard J. Musgrave, at the number listed below to facilitate advancement of the present application.

Respectfully submitted,

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